

REMARKS

Reconsideration of the above-identified patent application in view of the following remarks is respectfully requested.

Claims 1-10, 13-24, and 27-33 are in this application.

Following the Examiner's comments on claim limitations, the independent claims have been amended so as to include the limitation that the points of the input space are orthogonally spaced.

Specifically, Claims 1 and 15 have been amended to specify that, in order to optimize a process having an input space, the points chosen are orthogonally spaced in the input space. Independent Claim 24 was previously presented as a method of automatic optimization of a process, wherein the process is run at preselected points in an input space, the preselected point orthogonally placed in the input space using data generation formula.

Referring now to the Examiner's explicit rejections and objections:

Claim Rejections - 35 USC 112

Claims 1-10, 13-24, and 27-33 are rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement, as the claims contain subject matter which was not described in the specification in such as way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

In particular, the Examiner has stated that the specification does not relate to "online optimization" (amended claims 1, 15, and 24). Additionally, the Examiner has noted that the specification does not specifically disclose a "model based controller" (claim 15).

On consideration of the above, the claims have been amended in a manner it is believed will overcome the objections of the Examiner discussed above. Specifically, claim 15 has been amended to relate to "a controller."

With regard to the term "online" included in claims 1, 15, and 24, the Examiner's interpretation of this term to mean "connected to the Internet" has been noted. While it is understandable that the Microsoft Computer Dictionary, on which the Examiner has relied for this interpretation, would define "online" in this manner, it is submitted that it is not the intention of the Applicant to imply that the present invention is related to optimization of a process via the Internet. Instead, the Examiner's attention is drawn to the reference www.wikipedia.org, wherein the term "online" is defined as follows: "In general, something is said to be **online** if it is connected to some larger network or system...." Several more specific meanings exist, including: "In a system for the performance of a particular task, an element of the system is said to be online if it is operational. For instance, a power plant is online if it is supplying power to the power grid. Alternatively, a section of road may be said to be online if it is open to traffic."

In light of the above, it is submitted that the term "automatic online optimization of a process" in Claims 1, 15, and 24 relates to the optimization of a process once a system is operational. Indeed, the specification, at the bottom of page 17, states that "In a preferred embodiment, once the system begins to operate using data obtained according to the above procedure, actual process data is obtained."

It is believed that, in light of the amendment to Claim 15 and the explanation provided above, the claims may be seen as complying with the written description requirement.

Claim Rejections – 35 USC 103

The Examiner has rejected claims 1-10, 13-24, and 27-33 under 35 U.S.C 103, as being unpatentable over U.S. Patent 5,781,430 issued to Tsai; in view of U.S. Patent 6,373,033 issued to de Waard, et al.; in further view of U.S. Patent 6,725,112 issued to Kaminsky, et al.; and in further view of applicant's admission that the claimed measurement unit, controller, and regressor were known in the art and available to a skilled artisan at the time of the invention. The Examiner's rejection is respectfully traversed. The independent claims have been amended to recite process control in regular process operation using a predictive model, wherein data is obtained for the model in an initial experimental phase in which the process is operated over a minimal number of experiments to obtain maximal usable data.

The Examiner's suggestion that the measurement unit, controller, and regressor are features which are functionally equivalent to features provided by various modules discussed in the cited art has been noted. It would not, however, have been obvious to one having ordinary skill in the art to employ the teachings of Tsai and de Waard to realize the claimed invention.

Neither Tsai nor de Waard teaches process control for regular operation using a predictive model, which predictive model obtains data using an experimental phase of process operation, the data including inputs and correspondingly mapped predictive outputs, wherein said operating points are orthogonally spaced in an input space within which the process is operable.

As to the patent to Kaminsky et al., this discloses a method for optimization of a product design, the method including specifying product application parameters, obtaining predetermined factors and responses in response to the parameters, obtaining a transfer

function which relates at least one factor to at least one response, and optimizing the transfer function to generate an optimized factor and an optimized response. It would not have been obvious to one having ordinary skill in the art to combine the teachings of Tsai and de Waard with the teachings of Kaminsky to realize the claimed invention.

Kaminsky et al. neither shows nor discusses two distinct stages. In contrast, the present invention teaches two separate stages, where, first, experimental running of a process is carried out to obtain predictive data and, second, actual running of the process is carried out to obtain desired outputs.

There is no evidence that one skilled in the art would be motivated to combine the teachings of Tsai, de Waard, and Kaminsky to arrive at the two stage system and method for process optimization, as discussed above.

Conclusion

Independent claims 1, 15 and 24 each contain combinations of features that are neither anticipated by nor obvious in light of the art. Applicant is of the opinion that independent claims 1, 15 and 24, and consequently all claims dependent therefrom, are in condition for allowance.

All the issues raised by the Examiner have been dealt with and applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



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Date: January 25, 2006